

IN THE SENATE OF THE UNITED STATES.

FEBRUARY 21, 1865.—Ordered to be printed.

FEBRUARY 23, 1865.—Ordered that 1,000 additional copies be printed—500 for the use of the Senate and 500 for the use of the Smithsonian Institution.

Mr. FOOT submitted the following

REPORT.

Resolved by the Senate, (the House of Representatives concurring,) That the Committee on Public Buildings and Grounds of the Senate, jointly with the Committee on Public Buildings and Grounds of the House, be, and they are hereby, directed to inquire into the origin of the fire by which the Smithsonian Institution buildings, and the valuable deposits therein, were, on Tuesday, the 24th of January, in whole or in part destroyed; the approximate loss to the government and to private persons; the means necessary to preserve the remaining portions of said building and its contents from further injury; and such other facts in connexion therewith as may be of public interest, and to report by bill or otherwise.

The joint committee of the Senate and House of Representatives on public buildings and grounds, to which was referred the above resolution, respectfully report:

That they visited the building, inquired into the origin of the fire, the character and extent of the loss sustained, and requested the regents, through the secretary, to furnish a written report on the subject of investigation. In accordance with this request the following report was presented:

REPORT OF THE SPECIAL COMMITTEE OF THE BOARD OF REGENTS OF THE
SMITHSONIAN INSTITUTION RELATIVE TO THE FIRE.

The special committee appointed by the board at its meeting on January 28, 1865, to inquire into the origin of the fire at the Smithsonian Institution, to ascertain the extent and character of the loss sustained, and to make suggestions as to what measures should be adopted for the repair and improvement of the building, respectfully report that they have performed the duty assigned them, so far as the time and their means of information would permit.

I.—THE ORIGIN OF THE FIRE.

The testimony has been taken of all persons connected with the establishment that had any knowledge of the occurrence, and a written account of the whole is herewith submitted; also a report from Colonel B. S. Alexander, United States army, who superintended the fire proofing of the main building, of his examination of the flues connected with the accident.

It is evident, from the concurrent testimony thus obtained, that the fire commenced in the southwest part of the roof of the main building in the wood-work immediately under the slate covering, and that it was kindled by the heated air or sparks from a stove which had been temporarily placed in the

room immediately below. The pipe of this stove had been inserted, by mistake, into a brick furring-space resembling a flue, which opened under the rafters instead of into the chimney flue, within a few inches of the latter. By whom the hole into which the pipe was inserted was originally made is not known, but it is remembered that a stove-pipe was put into it as far back as 1854, at the time of the exhibition held by the Mechanics' Institute in the building. No fire, however, had been in this room for ten years previous to Monday, 15th January, when the mechanist and carpenter of the institution were engaged, with several other of the employés, in rearranging the pictures of the gallery, the weather at the time being unusually cold. These persons, for temporary convenience, set up the stove above mentioned, intending to remove it as soon as their task was finished. A coal fire, kindled with wood, had been burning in this stove for eight days previous to the conflagration, yet it appears from the testimony that no evidence of combustion was observed by a person who passed through the loft six hours before the breaking out of the flames. It is probable, however, that the wood had been undergoing a process of charring for several days.

On account of the very expensive style of architecture selected for the building, and the limited means at the command of the board, the plan had been at first adopted of finishing the interior of the whole edifice with wood and plaster. A large portion, however, of the interior woodwork of the main building, after the roof and exterior had been finished, gave way and fell; whereupon the regents ordered the removal of the woodwork and its place to be supplied with incombustible materials. Thus the main building was rendered fire-proof, with the exception of the supports of the roof, which being covered with slate was assumed to be safe. The only danger of the occurrence of fire was supposed to exist in the two wings and the towers, and to guard against this contingency especial precautions were constantly observed, viz: 1. No smoking was allowed in any part of the building at any time. 2. No lights were allowed to be carried from one part of the building to another except in lanterns. 3. Three coils of large hose were deposited, ready for use, one in the upper story and the other two on the first floor of the building; and there were water-pipes in the basement with faucets. 4. Barrels and buckets, kept constantly filled with water, were placed at different points of the building. 5. The rule was observed of cleaning the flues every autumn before the commencement of fires. 6. A watchman was employed each night, who made every hour the rounds of all the rooms in the building, giving special attention to those in which fire had been kindled during the day, including the apartments occupied by the family of the secretary.

These precautions, however, as it has proved, were of no avail—the fire having occurred at a point where no danger was apprehended, and to which access could with difficulty be obtained.

II.—THE CHARACTER AND EXTENT OF THE LOSS SUSTAINED.

The loss to the institution was as follows :

1. The contents of the secretary's office, consisting of the official, scientific, and miscellaneous correspondence, embracing 35,000 pages of copied letters which had been sent, at least 30,000 of which were the composition of the secretary, and 50,000 pages of letters received by the institution. Here, moreover, were lost the receipts for publications and specimens; reports on various subjects which have been referred to the institution; the records of experiments instituted by the secretary for the government; four manuscripts of original investigations, which had been adopted by the institution for publication; a part of the manuscript material of the report of the secretary for 1864; a large number of papers and scientific notes of the secretary; a series of diaries and memo-

random books, and a duplicate set of account books, prepared during the last twelve years, with great labor, by Mr. Rhees, the chief clerk; also, about one hundred volumes of valuable works kept at hand for constant reference.

2. In the apparatus room, the large collection of scientific instruments, including the donation of the late Dr. Hare.

3. A part of the contents of the regents' room, including the personal effects of Smithson, with the exception of his portrait and library.

4. The contents of the rooms in the towers, including the meteorological instruments, the workshop, containing a lathe and a large number of valuable tools, nearly all the stock on hand of the duplicate copies of the annual reports, and many other public documents and books intended for distribution to libraries, as well as a quantity of stationery, hardware, &c.

5. The wood-cuts of the illustrations contained in the Smithsonian publications.

The loss to other parties was as follows:

1st. The contents of what was called the Picture Gallery, viz: *a.* About two hundred portraits, nearly all of life size, painted and principally owned by Mr. J. M. Stanley, formerly of this city, and now of Detroit, Michigan, and which were on deposit in the institution. *b.* A number of half-size Indian portraits, painted by Mr. King for the government. *c.* A copy, in Carrera marble, of the antique statue known as the "Dying Gladiator," by John Gott, and owned by Mr. J. C. McGuire, of this city.

2. A number of surveying instruments belonging to the government.

3. The clothing, books, and private effects of several of the persons connected with the institution, and of those engaged in scientific studies.

4. The library removed from Beaufort, South Carolina, by the army, and also that of Bishop Johns, from Fairfax Theological Seminary, given in charge to the institution by the Secretary of War for safe-keeping, which libraries were stored in an upper room in the south tower.

Independent of injury to the building, the loss to the institution, as far as it may be estimated and can be restored by money, may be stated at about \$20,000, and to individuals \$26,000, viz: To Mr. J. M. Stanley, \$20,000; Mr. J. C. McGuire, \$1,000; Prof. Joseph Henry, \$1,500; Mr. W. J. Rhees, \$1,200; Mr. W. DeBeust, \$1,300; and all others, \$1,000.

Although the loss which the institution and individuals have sustained is much to be regretted, yet it is a source of consolation that by far the greater part of the valuable contents of the building have escaped without injury. The valuable library of the institution, the most extensive, in regard to the transactions of learned societies and scientific books, in this country; the museum, including the collection of the exploring expedition and those of the institution; the large stock of many thousand duplicate specimens for distribution to all parts of the world; the records of the museum; a large portion of the correspondence relative to natural history; nearly all the records of meteorological observations which have been accumulated during the last fifteen years; the sets of Smithsonian publications (except the annual reports) which have been reserved to supply new institutions, and the stereotype plates of all the works which have been published during the last four or five years, have been saved. All the original vouchers of the payments made by the institution, the ledger in which they were posted, and the daybook from 1858, were also preserved, having been deposited in a safe in the regents' room. The contents of the connecting range between the library and the museum are uninjured; this includes a series of plaster casts and portraits of distinguished men, among the latter a life-size portrait of Guizot, by Healy; an original full-length figure of Washington, by the elder Peale, and also a valuable series of rare engravings illustrative of the history of the art, purchased from the Hon. George P. Marsh.

All the important acts of the regents from the beginning, and an account of

the operations of the institution, having been published from year to year in the several reports to Congress, a continued record of the history of the establishment from the beginning is, therefore, still in existence. As these reports have been widely distributed, they are generally accessible to the public.

The burning of the roof of the building can scarcely in itself be considered a calamity, since it probably would have occurred at some future time when a much larger accumulation of valuable articles might have been destroyed, and since it will now be replaced by one of fire-proof materials. The fire-proofing, as far as it was carried, was well done, and it is to this circumstance that the preservation of the most valuable objects of the establishment is due.

III.—SUGGESTIONS AS TO WHAT SHOULD BE DONE.

There can be no hesitation in adopting the conclusion that steps should be immediately taken not only to repair the injury, but to improve the condition of the building.

1. The main edifice should be provided with a metallic roof.
2. For the wooden conical terminations of the towers should be substituted metallic coverings.
3. All valuable articles belonging to the institution or deposited in it, including the library, should be placed in the main building, which should be cut off from the wings by iron doors.
4. Provision should be made for a thorough heating of the whole building by steam or hot water.
5. Suggestions should be requested from competent architects and engineers as to the work to be done, and those which are adopted should be embodied in working plans and drawings.
6. A building committee of the board should be appointed to have charge of the work.

No very exact estimate can as yet be made as to the cost of the repairs, &c., for it has not been possible, without erecting a scaffolding, to determine whether it will be necessary to take down the high northern tower. Colonel Alexander, of the engineer corps, however, has informed the committee that he thinks \$100,000 will be required to make the necessary repairs and improvements.

The committee cannot conclude without adding that, in their opinion, the occurrence of the fire ought not to be allowed to interfere with the active operations of the institution, on which essentially depends the reputation it has established throughout the world, and its efficiency as an instrument for "the increase and diffusion of knowledge among men." To the support and extension of these operations, therefore, the annual interest from the original fund should, as far as possible, continue as heretofore to be conscientiously applied.

Respectfully submitted:

RICHARD WALLACH,
JOSEPH HENRY,
Special Committee.

WASHINGTON, *February*, 1865.

At a subsequent meeting of the committee, Professor Henry was requested to state his connexion with the institution, to give an account of its objects and operations, the origin of the building, and such other facts as might be of public interest. In conformity with this request he made the following statement:

STATEMENT OF PROFESSOR HENRY.

I have been from the first, now eighteen years, the secretary or executive officer of the Smithsonian Institution; have had charge of all the property and been intrusted with the expenditure of the appropriations, and the general direction, under the supervision of the board of regents, of all the operations of the establishment.

Before my election I was requested by one of the regents to give a sketch of what, in accordance with the will of Smithson, I considered should be the plan of organization, and after due consideration of the subject there was not the least shadow of doubt in my mind that the intention of the donor was to found a cosmopolitan institution, the effects of which should not be confined to one city or even to one country, but should be extended to the whole civilized world.

This opinion was shared in whole by Professor Bache, and in part by other members of the board; and I was elected secretary and was induced to accept the office, though with much solicitude as to the result, with the view of assisting in developing and reducing to practice a corresponding plan of organization.

In order to present the inferences and suggestions which flow from the study of the will in a definite form, they were afterwards stated in a series of propositions, given below, which have continued to serve as the basis upon which the operations of the institution have been conducted.

Smithson left his property "*to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men.*"

These are the only words of the testator to serve as a guide to the adoption of a plan for the execution of his benevolent design. They are found, however, when attentively considered, to admit of legitimate deductions sufficiently definite and comprehensive.

"1. The bequest is for the benefit of mankind. The government of the United States is merely a trustee to carry out the design of the testator.

"2. The institution is not a national establishment, as is frequently supposed, but the establishment of an individual, and is to bear and perpetuate his name.

"3. The objects of the institution are, 1st, to increase, and, 2d, to diffuse knowledge among men.

"4. These two objects should not be confounded with one another. The first is to enlarge the existing stock of knowledge by the addition of new truths; and the second, to disseminate knowledge thus increased among men.

"5. The will makes no restriction in favor of any particular kind of knowledge; hence all branches are entitled to a share of attention.

"6. Knowledge can be increased by different methods of facilitating and promoting the discovery of new truths, and can be most extensively diffused among men by means of the press.

"7. To effect the greatest amount of good, the organization should be such as to enable the institution to produce results, in the way of increasing and diffusing knowledge, which cannot be produced either at all or so efficiently by the existing institutions in our country.

"8. The organization should also be such as can be adopted provisionally, can be easily reduced to practice, receive modifications, or be abandoned, in whole or in part, without a sacrifice of the funds.

"9. In order to compensate, in some measure, for the loss of time occasioned by the delay of eight years in establishing the institution, a considerable portion of the interest which has accrued should be added to the principal.

"10. In proportion to the wide field of knowledge to be cultivated, the funds are small. Economy should therefore be consulted in the construction of the building; and not only the first cost of the edifice should be considered, but also the continual expense of keeping it in repair, and of the support of the establishment necessarily connected with it. There should also be but few individuals permanently supported by the institution.

"11. The plan and dimensions of the building should be determined by the plan of the organization, and not the converse.

"12. It should be recollected that mankind in general are to be benefited

by the bequest, and that, therefore, all unnecessary expenditure on local objects would be a perversion of the trust."

The plan proposed in conformity with these propositions, and which especially commended itself to men of science, to which class Smithson belonged, was that of an active, living organization, intended principally to promote the discovery of new truths by instituting original researches, under the direction of suitable persons, in history, antiquities, ethnology, the various branches of physical science, such as astronomy, chemistry, geology, &c., to institute explorations for the purpose of developing the physical geography and natural history of this continent, to establish posts of observations tending to advance in the most direct manner the science of meteorology, &c., &c.

For the diffusion among men of the knowledge thus produced, it was proposed to publish a series of quarto volumes, to be called "Smithsonian Contributions to Knowledge," and to include in these the labors and original researches of inquiring and sagacious minds, which could not otherwise be given to the world, and as promotive of the same end; furthermore, to issue a series of reports, giving an account of the new discoveries in science, and of the changes made from year to year in all branches of knowledge not strictly professional, as well as to publish occasionally manuals which might serve to assist observers, and direct attention to special branches of investigation.

This plan, which was probably in the mind of the donor when he gave expression to the few but comprehensive words which indicate the objects of his bequest, has proved eminently successful. Its operations, limited only by the income, are such as to affect the condition of man wherever literature and science are cultivated, while it tends in this country to give an impulse to original thought, which, amidst the strife of politics and the inordinate pursuit of wealth, is, of all things, most desirable.

Although it has since commanded the approval of unprejudiced and reflecting persons generally, it was unfortunately at variance with the preconceived ideas of many influential persons, and was not considered by them as embodying the requirements of Congress in the act of organization.

The plans of organization which had for the most part been previously advocated were principally of local influence, or such as merely embraced objects intended for the diffusion of popular knowledge, while they neglected the first and essential requisition of the bequest, viz. the *increase* of knowledge, or, in other words, the advance of science through original researches, or the discovery and promulgation of new truths. Before my election and the presentation of the views above recited, a plan had been reported by a special committee of the regents, confining the operations of the institution principally to a library, a museum, a gallery of art, and other local objects in connexion with a system by which itinerant lecturers were to be employed to give instruction in different parts of the country; the general style of the building had also in effect been decided upon.

It was vainly urged that a large and expensive building was not necessary to carry out the object proposed in the will of Smithson, and that, even were it concluded to erect eventually a large edifice, it would be more prudent to commence with a small structure, to which additions might from time to time be made, as the wants of the institution should require. These remonstrances were met by the objection that the law of Congress directed provision to be made on a *liberal scale* for the accommodation of the museum of the government then at the Patent Office. The influence of the authorities of the city, of the press, and of all persons who were pecuniarily interested directly or indirectly in contracts, or otherwise, and the fascination of the architectural display, as presented on paper, was too strong to be resisted, and the plan of the present building was finally adopted.

Two very grave errors were thereby committed: 1st, the plan was but little

adapted to the uses to which the building was to be applied ; 2d, the style of architecture required a far greater expenditure than the amount to which the cost of the building was limited. In proportion to the extent of the exterior walls the enclosed space is exceedingly small ; the buttresses, turrets, and towers, while they add very little to the accommodation of the building, very much increased the cost. To have constructed the building in a substantial and durable manner, in strict conformity with the Lombard style of architecture which was adopted, would have required an expenditure of at least double the amount of the sum appropriated for the purpose. It was therefore, necessary in the very inauguration of an enterprise intended for the advancement of *truth* to have recourse to a false presentation of groined arches and fretted roofs of stone by means of wood, stucco, and paint. The two wings and the two connecting ranges were completed in this manner. The main building, which is 200 feet long and 50 wide, embellished with six towers, was also in process of completion, the framing of the interior having been finished, when the underpinning gave way and the whole of the woodwork was precipitated to the ground. After the occurrence of this accident a commission of architects, appointed to examine the plans and construction of the building, reported that the exterior walls were well built, both in regard to construction and materials, but that the plan of finishing the interior in wood and stucco was improper for an edifice intended to contain valuable articles ; it was therefore recommended that fire-proof materials should be employed for the portions of the work which remained to be constructed. In conformity with this recommendation the interior of the main building was completed in iron, stone, and brick, with the exception of the roof, which, being covered with slate and not supposed to be exposed to danger from fire, was suffered to remain. This change in the mode of construction added of course materially to the cost of the building, which, originally estimated at \$210,000, has in reality amounted to upwards of \$300,000.

In order to meet the large expenditure on the building ; to provide for the support of the establishment necessarily connected with it, and to leave the greater part of the interest of the original bequest free to be applied to its more legitimate objects, it was resolved to create an extra fund, and for this purpose the following course was pursued :

1. The building was erected in parts, and its different portions gradually brought into requisition, its completion being thus delayed for a number of years, at first limited to five, but extended after the accident before mentioned to nine years.

2. The sum appropriated to the building, furniture, and grounds, viz. \$250,000, being mainly the interest which had accrued previous to the organization, was invested in United States treasury stock, bearing interest.

3. The plan of organization was gradually developed, and, instead of expending upon it from the first the whole interest of the original bequest, a part of this was also invested in treasury bonds.

This plan was so successfully and steadily carried out, that at the commencement of the war, after paying for the building, accumulating a very valuable library, establishing and supporting a large museum, and carrying on all the active operations of the establishment, an extra fund had been created amounting to \$140,000. In order to secure this from the contingencies of any future expenditure on buildings or loss from hazardous investment, a petition was preferred to Congress to take it from the care of the regents and deposit it with the original principal in the treasury of the United States, subject to the same restriction, viz. that the interest alone could be expended. This petition not having been acted upon, the regents deemed it expedient to invest the money in such State stocks as were then considered most eligible.

The following investments were accordingly made :

In Indiana	5	per cent. stock	\$75,000
" Virginia	6	" " "	53,500
" Tennessee	6	" " "	12,000
" Georgia	6	" " "	500
" Washington	6	" " "	100
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				141,100
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With the assistance of the income from this additional fund, the institution, when its plans were fully developed, was not only enabled to support a large local establishment, but to produce results of great importance in the way of increasing and diffusing knowledge—results which have attracted the attention of the civilized world, and convinced, it is believed, those who were most skeptical as to the success of the plan of active operations, of its practicability, its usefulness, and its strict conformity to the terms of the bequest.

In the unhappy distractions of our country, no income has been received since the beginning of the war from the southern stocks, and this, with the great increase of prices, has materially interfered with the extent of the operations of the institution.

In view of the great expenditures of the government on account of the war, the institution did not at first urge, as it might reasonably have done, the request to have the annual income from the original bequest paid in specie, as all the other funded debts of the United States are paid. But now that a large outlay will be required to repair the damages caused by the fire, the necessity can scarcely be evaded of urging this measure upon the Secretary of the Treasury or upon Congress. That this claim of the institution is a just one is the unanimous opinion of the board of regents, and among them of Chief Justice Chase. The institution has always studiously avoided asking Congress for any appropriation on its own account, nor does it now, while burdened with the cost of the repairs of the accident, ask for an appropriation even to assist in protecting the property of the United States stored in its building. Its simple request is to receive its annual dues in the same kind of payment which is made to other similar creditors of the government.

It is to be regretted that the law of Congress organizing the institution directed that provision should be made on a large scale for a library and museum, since if all the income of the bequest were applied to either, it would be scarcely sufficient to establish and support one of the first class. A conscientious endeavor, however, has been made to harmonize the whole scheme; and notwithstanding the inauspicious circumstances which attended the commencement of the institution, as before stated, and the difficulties with which it has had to contend from time to time, the results it has produced have been such as to commend it to the public generally throughout our own country, and to make it favorably known to the cultivators of science wherever found. It has identified itself with the history of almost every branch of knowledge which receives attention at the present day, and its transactions and proceedings are constantly referred to as authoritative on all subjects to which they pertain. With no desire to exaggerate its importance or advantages, the fact may be satisfactorily cited that the recognition of its services in behalf of science exists in the contemporary works of all languages, and that its publications are found wherever letters are cultivated, and its specimens in all the principal museums of the world. If it was the desire of the founder to perpetuate the memory of his liberality, that desire has been thus fully gratified, nor is the memorial of his enlightened and comprehensive benevolence limited as to place or time, since

it is constantly renewed with the dissemination of each publication which bears his name.

The following brief history of the labors of the institution up to the present time will not only serve to show what it has done, but also to illustrate the capability of the plan of active operations for producing important results in the way of advancing and diffusing knowledge among men.

ACTIVE OPERATIONS.

Publications. The Smithsonian Institution has established three classes of publications, in which are contained the articles hereafter to be mentioned. These are as follows :

1. A quarto series, entitled "Smithsonian Contributions to Knowledge," issued in volumes, each embracing one or more separate articles. Of these the fourteenth is nearly through the press.

2. An octavo series, entitled "Smithsonian Miscellaneous Collections," which in the aggregate makes six large volumes.

3. Another octavo series, consisting of the annual reports of the institution to Congress, called "Smithsonian Reports," of which eleven volumes have been published.

The Smithsonian Contributions to Knowledge include memoirs embracing the records of extended original investigations and researches resulting in what are believed to be new truths, and constituting positive additions to the sum of human knowledge.

The series of Smithsonian Miscellaneous Collections contains reports on the present state of our knowledge of particular branches of science ; instructions for collecting and digesting facts and materials for research ; lists and synopses of species of the organic and inorganic world ; museum catalogues ; reports of explorations ; aids to bibliographical investigations, etc., generally prepared at the express request of the institution, and at its expense.

The Annual Reports include the official reports of the secretary to the board of regents of the operations and condition of the institution ; the reports of committees of the board ; abstracts of lectures delivered before the institution ; extracts from correspondence ; original or translated articles relating to the history and progress of science, etc.

The following rules have been observed in the distribution of the first and second series :

1. They are presented to all learned societies of the first class which publish transactions, and give copies of these, in exchange to the institution.

2. To all foreign libraries of the first class, provided they give in exchange their catalogues and other publications, or an equivalent, from their duplicate volumes.

3. To all the colleges in actual operation in this country, provided they furnish, in return, meteorological observations, catalogues of their libraries and of their students, and all other publications issued by them relative to their organization and history.

4. To all States and Territories, provided they give, in return, copies of all documents published under their authority.

5. To all incorporated public libraries in this country, not included in any of the foregoing classes, now containing 10,000 volumes ; and to smaller libraries, where a whole State or large district would be otherwise unsupplied.

Institutions devoted exclusively to the promotion of particular branches of knowledge receive such articles published by the institution as relate to their objects. Portions of the series are also given to institutions of lesser grade not entitled, under the above rules, to the full series, and also to the meteorological correspondents of the institution.

The reports are of a more popular character, and are presented :

1. To all the meteorological observers and other collaborators of the institution.
2. To donors to its library or museum.
3. To colleges and other educational establishments.
4. To public libraries and literary and scientific societies.
5. To teachers or individuals who are engaged in special studies, and who make direct application for them.

Besides the works which have been published entirely at the expense of the institution, aid has been furnished by subscription for copies to be distributed to foreign libraries of a number of works which fall within the class adopted by the programme. The principal works of this kind for which subscriptions have been made are as follows : Agassiz's Contributions to Natural History, Gould's Astronomical Journal, Shea's American Linguistics, Runkle's Mathematical Monthly, Deane's Fossil Footprints, Tuomey & Holmes' Fossils of South Carolina, Peirce's Analytic Mechanics.

Meteorology.—The investigation of all questions relative to meteorology has been an object to which the institution has devoted special attention, and one of its first efforts was to organize a voluntary system of observation, which should extend as widely as possible over the whole of the North American continent. It induced a skilful artisan, under its direction, to commence the manufacture of carefully compared and accurately graduated instruments, now generally known as the Smithsonian standards. It prepared and furnished a series of instructions for the use of the instruments and the observations of meteorological phenomena ; also three series of blank forms as registers.

It next organized a body of intelligent observers, and in a comparatively short time brought the system into practical operation ; each year the number of observers increased, and where one ceased his connexion with the enterprise, several came forward to supply his place. By an arrangement with the surgeon general of the army, the observations made at the United States military posts in different parts of the country, and also the system which had previously been established by the State of New York, were remodelled so as to harmonize with that of the Institution. Gentlemen interested in science residing in the British provinces, and at nearly all the posts of the Hudson's Bay Company, also in Mexico, Central America, the West Indies, and some places in South America, &c., joined in this enterprise ; and, with few exceptions, at the beginning of the war every district of considerable size had in it at least one if not more observers. All these contribute their services without compensation. Their only reward is the satisfaction of co-operating with each other and the institution in the effort to supply data and materials for investigation. Any returns, indeed, which the institution has in its power to make are gladly rendered in a hearty acknowledgment of assistance, and in copies of all the Smithsonian publications likely to be of interest.

Beside the materials obtained directly from the observers of the institution, a large amount of other matter relative to the meteorology of North America has been accumulated ; such as copies of all the known series of records for long periods which could be obtained ; series which have been compiled during explorations and surveys for the government, those which have been the result of local associations, and of the system of observations established in connexion with the survey of the great lakes, as well as the common school system of Canada, and many thousand notices of the weather at different times and places, collected from newspapers and periodicals.

No other part of the world has offered such facilities for the collection of meteorological data, the system extending over so large a portion of the earth's

surface, the observers, with few exceptions, all speaking the same language, and many of them being furnished with full sets of compared standard instruments.

It is to be regretted that this system has been partially interrupted during the war, and that the portion of the income of the Smithsonian fund, which could be devoted to the reduction and discussion of the material collected, has not been adequate to the labor of deducing from so large a body of data all the valuable truths which they are capable of affording. It has had assistance, however, from the agricultural department of the Patent Office, by which the results of five years' observations of all the elements and a series of temperatures for long periods have been prepared for publication.

From all the observations made up to 1860, isothermal charts were constructed presenting much more accurately than had ever been done before, the distribution of temperature over the continent of North America; a series of rain charts, and also a large map, exhibiting the regions of original forest, of arable prairie and of desert in the United States, have also been prepared.

The institution has fully established the fact, which was previously indicated in regard to storms, by the investigations of Mr. Espy and others, in relation to the United States, namely, that all such meteorological phenomena, as variations in the pressure of the atmosphere, sudden changes of temperature, either of unusually warm or cold weather, thunder-storms, tornadoes, as well as storms of wind, rain, &c., which occur within the temperate zones, travel from west to east. The simultaneous system of observations established by the institution furnished the means of placing this great law of meteorology in prominent relief, and of first reducing it to practical utility.

As early as 1849 the institution organized a system of telegraphic despatches, by which information was received at Washington of the condition of the weather at distant places in the southwest and northwest, and from this, in accordance with the law before mentioned, it was often enabled to predict, sometimes a day or two in advance, the approach of any larger disturbances of the atmosphere. Subsequently the telegraphic despatches were daily exhibited at the institution on a map of the United States by means of a series of movable cards of different colors, which indicated the meteorological condition at various points, showing at a glance in what parts of the country it might be clear or cloudy, raining or snowing; and by arrows the existing direction of the wind. The returns were also published in one of the evening papers. Unfortunately this enterprise was interrupted, by the cessation of the observations in the southwest, and by the constant use of the telegraph for the purposes of the government.

The advantages possessed by the Smithsonian Institution for investigations of this kind will be evident, when it is recollected that a large portion of its observers are stationed west of Washington, that the phenomena approach it over a large extent of land, and can be critically noted through every part of their passage eastward, while the phenomena which are presented to the meteorologists of Europe traverse in reaching them a wide expanse of ocean, from which only casual observations can be gleaned.

The publications of the institution contain many memoirs which have tended to advance the science of meteorology. Among these may be mentioned the meteorological and physical tables prepared at the expense of the institution by Professor Guyot, and filling a large octavo volume of the miscellaneous collections. No work extant answers the same purpose with the one referred to, which has hence become a general standard of reference, the constant demand for it as well in Europe as America having required the printing of several successive editions.

The results of the reductions for five years previous to 1860 have been published in two volumes of nearly 2,000 quarto pages, containing a mass of materials of great value in determining the average temperature, fall of rain,

barometrical pressure, moisture, direction of the wind, and time of various periodical phenomena relative to plants, animals, &c.

In addition to these large and important volumes, other works have been published by the institution which have had a marked influence on the progress of meteorology. Among these may be mentioned the works of Professor Coffin, on the winds of the northern hemisphere; of Mr. Chappelsmith, on a tornado in Illinois; of Professor Loomis, on a great storm which pervaded both America and Europe; the reduced observations for twenty-eight years of Professor Caswell, at Providence, Rhode Island; of Dr. Smith, for twenty years in Arkansas; of Dr. Kane and Captain McClintock, in the arctic seas; on the heat and light of the sun at different points, by Mr. Meech; on the secular period of the aurora, by Professor Olmsted; the occurrence of auroras in the arctic regions, by Mr. P. Force, &c.

Besides these a series of meteorological essays embodying many of the results obtained from the investigations at the institution has been prepared by the secretary, and been published in the agricultural reports of the Patent Office.

Astronomy.—The institution has advanced the science of astronomy both by its publications and the assistance rendered to observers. To facilitate astronomical observations it prepared and published for six years an annual list of occultations of the principal stars by the moon, and printed and distributed a series of tables for determining the perturbations of the planetary motions, the object of which determination is to facilitate the calculation of the places of the heavenly bodies. These tables have accomplished the desired end, saving to the practical astronomer an immense amount of tedious and monotonous labor.

The name of the institution has been favorably connected with the history of the interesting discovery of the planet Neptune. From a few of the first observations which had been made on this planet Mr. Sears C. Walker calculated its approximate orbit, and by this means tracing its path through its whole revolution of 166 years he was enabled to carry it backward until it fell among a cluster of stars, accurately mapped by Lalande, towards the close of the last century. After minute inspection he was led to conclude that one of the stars which had been observed by Lalande in 1795 was the planet Neptune. He was thus supplied with the amount of its motion for upwards of fifty years, from which he deduced a much more perfect orbit, and was enabled to construct an ephemeris giving the place of the planet for several years in succession. These investigations, so interesting to astronomy and honorable to this country, were prosecuted and published at the expense of the Smithsonian Institution.

To render more generally accessible to practical astronomers in this country the theory of the motion of the heavenly bodies by the celebrated Gauss, the institution shared the expense of publishing a translation of this treatise from the Latin. It furnishes a complete system of formulas for computing the movements of a body in any of the curves belonging to the class of conic sections, and a general method of determining the orbit of a planet or a comet from three observations, as seen from the earth.

For a number of years aid was afforded to the publication of Gould's American Astronomical Journal, which rendered good service to the science by making promptly known to foreign observers the results of the labors of their contemporaries in America. It has also reduced and published at its own expense the astronomical observations made by Dr. Kane in the arctic regions, and has now in hand those which were made in the same regions by Dr. Hayes.

Congress having authorized in 1849 an astronomical expedition under Lieutenant Gilliss to the southern hemisphere for the purpose of determining the parallax of the planets, and consequently their distance from the sun by observations on Venus and Mars, accidentally failed to make the appropriation for instru-

ments. This omission was supplied by the institution, which was subsequently indemnified for the expense by the Chilian government.

In the observation of all the large solar eclipses which have happened since the date of its organization, the institution has actively and efficiently co-operated by publishing projections of the phases and times of their occurrence in different parts of America.

Under its auspices, and partly at its expense, an expedition was inaugurated to observe the great eclipse of 1858 in Peru, from which data of value for the improvement of solar and lunar tables were determined, besides facts of interest in regard to the physical constitution of the sun.

Assistance was also rendered to the expeditions under the direction of the Coast Survey to observe the eclipse of July 18, 1860, one of which was sent to Labrador, under the charge of Professor S. Alexander, of New Jersey, and the other to Washington Territory, under that of Lieutenant Gilliss.

To these may be added an account of an instrument invented by Rev. T. Hill, president of Harvard College, for the projection of eclipses.

Physics and chemistry.—The institution has fostered these sciences in many different ways; among others, by importing models of the most approved articles of apparatus, and making them known to scientific men through lectures and otherwise.

It has instituted an extensive series of experiments on building materials, particularly in reference to those employed by the government in the construction of the Capitol and other public edifices; also a like series on acoustics, as applied to public halls, and the principles deduced from these practically applied in the construction of a model lecture-room. It has made a very extended series of experiments on different substances employed for light-house illumination, from which has resulted the substitution of another material for sperm oil, and the consequent annual saving of a large amount of money to the government.

In compliance with requests made by different departments of the government, and of Congress, particularly since the war, it has conducted various series of investigations, principally in relation to questions involving mechanical, chemical, and physical principles, and has made reports on subjects of this kind amounting, in the aggregate, to several hundred.

To facilitate researches, a laboratory has been established and kept constantly in working condition, the privilege of using it having been given to various competent persons for experimenting in different branches of physical science. Just now it is occupied by Dr. Wetherill for the purpose of conducting a series of analyses of samples of air from the halls of Congress, &c., from which a report is to be made, under the direction of the institution, on the ventilation of the public buildings of this city.

The most important publications under this head are the researches relative to electric currents, by Professor Secchi; on the explosibility of nitre, by Dr. Hare; on the ammonia-cobalt bases by Drs. Gibbs and Genth, and on astronomical photography, by Dr. Henry Draper.

A valuable report on recent improvements in the chemical arts by Booth & Morfit was published in 1852, and there have been given in the annual reports of the institution a series of translations and articles presenting a view of the progress of physics and chemistry from year to year, since 1853, among which we may particularly notice the translation of Muller on recent contributions to electricity, and the reprint of Powell on Radiant Heat.

Terrestrial magnetism.—The subject of terrestrial magnetism has been prosecuted simultaneously with that of meteorology, and an observatory was erected in the Smithsonian grounds, fitted up with the most approved instruments, and conducted under the joint auspices of the institution and of the Coast Survey.

After remaining in operation for several years the instruments were transferred to Key West, as a remote station where observations were still more desirable. Instruments were also furnished an expedition to Mexico, and used with much success by Mr. Sonntag, whose results were published in the Smithsonian Contributions to Knowledge. Apparatus was also furnished to Dr. Kane, Dr. Hayes, and other explorers, by means of which valuable results were obtained.

Of the more important publications of the institution, which have tended to advance this science, may be mentioned the articles, by Dr. Locke, on the dip and intensity; the elaborate discussion, by Professor Bache, of the magnetic observations made at Girard college from 1841 to 1845; the report on magnetical observations in the arctic seas by Dr. Kane, reduced at the expense of the institution by Mr. C. Schott, and those made in Pennsylvania and adjacent States by Professor Bache, and in Mexico by Mr. Sonntag.

Explorations.—In the deficiency of means for more extended operations, as has been frequently represented in the annual reports, the efforts of the institution in the line of explorations and collections are confined, as strictly as possible, to America; but within this limit there are few regions which have not furnished scope, in some form, to its activity. Arctic America, all the unknown portions of the United States, Mexico, Central and South America, and the West Indies have been laid under contribution for facts and materials by which to advance science.

An eminently useful influence has been exerted by the institution through the aid it has afforded in the organization of the different government explorations by land and by sea. Whether by official representations to the heads of departments, or personal influence with officers and employés, it has secured the engagement of individuals competent to collect facts and specimens; it has instructed persons thus engaged, and others, in the details of observation; it has superintended the preparation, and, in some cases, borne the expense of the necessary outfits; has furnished fresh supplies from time to time to the collectors while in the field; received the collections made, and preserved them for future study, or at once consigned them to the hands of competent persons, both at home and abroad, for investigation; directing the execution of the necessary drawings and engravings for the reports, and finally superintending the printing and even the distribution of any available copies of the completed works to institutions of science. Prior to the establishment of the institution but little had been done by our government in the way of scientific explorations, with the exception of that under Captain Wilkes. But since then nearly every United States expedition, whether a survey for a Pacific railroad route, a boundary line between the United States and regions north or south of it, or within its borders, a wagon-road across the Rocky mountains, or an ordinary topographical exploration, has been influenced and aided more or less, as above stated. A list of the expeditions has been, from time to time, published in the annual reports, and it is sufficient here to say that their total number up to the present time is about fifty.

Besides these, similar explorations have been carried on without any reference to the government, and either entirely or in a great measure at the expense of the institution, and always at its suggestion, or under its direction. Prominent among these may be mentioned the three years' researches in the arctic regions, by Mr. Kennicott, with the co-operation of gentlemen of the Hudson's Bay Company; of Mr. Drexler, in the region of Hudson's bay, and also in the Rocky mountains; of Mr. Coues, in Labrador; of Lieutenant Feilner, in Nebraska and Northern California; of Mr. John Xantus, at Fort Tejon, Cape St. Lucas, and in Western Mexico; of Lieutenant Trowbridge, on the coast of California; of Drs. Cooper and Suckley, in Western America generally; of Drs. Coues and Beers, in Kansas, New Mexico, and Arizona; of Dr. Irwin, in Arizona; of Dr. Hitz, about Laramie Peak; of Lieutenant Couch, in Texas and

Mexico; of G. Wurdeman, Lieutenant Wright, Captain Woodbury, and others, in Florida, and the Gulf of Mexico; of Dr. Sartorius, Professor Sumichrast, Dr. Berendt, in Mexico; Dr. Von Frantz, J. Carniol, in Costa Rica; of Mr. March, in Jamaica; of Mr. Wright, Dr. Gundlach, Professor Poey, in Cuba; Judge Carter, in Bolivia, besides many others.

In addition to the collections which have been received from explorations organized under the direction of the institution, large numbers of duplicate specimens have been presented by the meteorological observers and other Smithsonian collaborators, the whole forming a body of material for the illustration and study of the American continent unequalled by any collection previously made. The results of the explorations, however, as might be inferred, have not been confined to specimens alone, but have furnished information relative to the topography, geology, physical geography, ethnology, and the living fauna of the country and regions visited.

The results have been published by government, the institution, or other parties. The extent and importance of these publications may be seen in the volumes of the reports of the Pacific railroad and Mexican boundary surveys; of the United States astronomical expedition to Chili, under the late lamented Captain Gilliss; of Captain Stansbury's exploration of Utah; of Lieutenant Michler's of the Isthmus of Darien, &c., &c.; in the volumes of the Smithsonian publications, and in the transactions of nearly all the scientific institutions in the United States.

In order to facilitate the operations of collectors a series of directions and circulars have been prepared and widely distributed, for collecting, preserving, and transporting specimens of natural history, and also special instructions as to the collecting of nests, eggs, shells, insects, &c.

Description and distribution of collections and specimens.—The object of making these collections, in conformity with the policy of the institution, was not merely to supply a large museum in Washington with permanent specimens or duplicates for exchange, but to furnish the naturalists of the world with the materials for advancing the science of the natural history of North America, and of facilitating the study of its various branches by supplying museums, both in the United States and in Europe, with sets of type specimens.

In pursuance of this object, full sets of the specimens collected have been submitted to a large number of naturalists, both in this country and abroad, for critical study and description, and it is not too much to say that scarcely a monographic investigation has been conducted for ten years past in any branch of American zoology which has not derived part or the whole of its material from the Smithsonian collections. Duplicates of the specimens, when described, have been made up into series for distribution, always accurately labelled, and are usually types of some published investigation. The average of such distribution has, for the last ten years, been at least ten thousand specimens annually, while the distribution of 1864 amounted to nearly five thousand species and seventeen thousand specimens. In this way all the older museums in this country and Canada have been largely increased, and the foundation for several new establishments of a similar kind has been furnished. To all colleges and academies making special application labelled specimens have also been presented.

This distribution of specimens is very different from the ordinary exchanges conducted between institutions or individuals, which usually involve the return of an equivalent. The question with the Smithsonian Institution is, not what can be had in return, but where a particular specimen or series of specimens can be placed so as best to advance the cause of science, by being most accessible to the largest number of students engaged in original investigations.

Palæontology, geology, physical geography, &c.—Appropriations have been made for investigations of the surface formation of the Connecticut valley by Professor E. Hitchcock, and for the collection of materials for the illustration of the geology and palæontology of particular regions. Appropriation has also been made to Professor Guyot for a barometrical survey of the different parts of the Alleghany mountains, and to other persons for collecting observations on heights, as determined in different parts of the country by the various canal and railway surveys.

The publications on these subjects, besides the papers of Professor Hitchcock on surface geology, are as follows :

A Memoir on *Mosasaurus*, by Dr. R. W. Gibbs.

On the extinct species of the fossil ox and sloth of North America, and on the ancient Fauna of Nebraska, by Dr. Leidy.

On the Physical Geography of the Mississippi Valley, by Charles Ellet.

On the Law of Deposit of Flood Tide, by Admiral Davis.

On the Fluctuations of the level of the great American Lakes, by C. Whitteley.

On the Palæontology of the Upper Missouri, and Check List of miocene cretaceous and jurassic Invertebrata, by F. B. Meek.

A memoir by Dr. Leidy, now in press, on the extinct reptiles of the cretaceous period, will, it is believed, be a valuable manual of reference.

The institution has published a check list of minerals, with their symbols, prepared by Mr. Egleston, with special reference to facilitating the labelling of the Smithsonian minerals and the exchange of specimens, and it may be mentioned that the institution has made an extensive distribution of specimens of building stone employed by the government.

Botany.—This branch of general natural history has been advanced by the institution, not only by means of the publication of the papers of original memoirs, but also by explorations and collections made at the expense of the Smithsonian fund. The most important work which has been published is a large quarto volume, illustrated by expensive colored plates, of the sea plants of the entire American coast. The work was written for the institution by Dr. Harvey, of the university of Dublin, and has been the means of rendering this family of the vegetable kingdom more generally known. The institution has also published several papers on the plants of New Mexico and California, by Dr. Gray, of Cambridge, and Dr. Torrey, of New York.

Duplicates of the specimens described have been presented to institutions at home and abroad. Considerable labor has also been expended in the preparation of an original report on the forest trees of America, by Dr. Gray. This work, however, has been interrupted for some time, but will be resumed, it is expected, during the present year.

General Zoology.—A large part of the collections made by the institution belong to the general class of zoology, intended to advance the study of animal life upon the continent of America.

The ornithology of America has always been a specialty of the Smithsonian Institution, more efforts having been made to perfect its collection in this department than any other. The institution has published the first part of a work by Dr. T. M. Brewer, suitably illustrated, on the distribution and habits of North American birds during the breeding season, with descriptions and figures of their eggs, the materials being derived entirely from the collections of the institution, and mostly made at its special request. This is the first separate work on North American zoology ever prepared. A catalogue of North American birds, prepared by Professor S. F. Baird, has been extensively used at home and abroad in labelling collections.

Professor Baird is now engaged in preparing a revision, or posting up, of our knowledge of North American ornithology to the present date, with the addition of the species of Central and South America and the West Indies. The materials being derived almost entirely from the specimens collected by the institution, which have been increased since the publication of the extensive work on the same subject by Professor Baird in the Pacific railroad report, from 12,000 to 35,000.

The collections which have been made by the institution for the illustration of mammalia have been very extensive, amounting to 6,000 specimens and have not only included many duplicates of every species previously known, but a very large number entirely new to science. A catalogue of North American mammals, chiefly those collected by the institution, prepared by Professor Baird, has been published and distributed to those interested in the study; also a monograph of North American bats, prepared by Dr. Hallen. Materials are now in course of accumulation to complete the account of the classes of mammals of North America which have not been included in the publications of the institution and Pacific railroad reports.

As with all American vertebrata, the collections of reptiles and fishes made by the institution have been very extensive, and numerous monographs or articles have been published relative to them in the Pacific railroad reports and the proceedings of different natural history societies, the institution having published a synopsis of the serpents of North America, and a monograph of the cottoids.

The institution has materially aided the study of the entomology of this country, not only by the collections in that branch but by preparing and publishing a series of works for the purpose of exhibiting the state of knowledge on the subject and facilitating its further advancement. It has published and distributed the following under this head:

Instructions for collecting and preserving insects, and catalogues, synopses, or monographs of the Diptera, Coleoptera, Lepidoptera, and Neuroptera, prepared by the most competent authorities in Europe and America.

It has also in course of preparation works relative to the Hymenoptera, Homoptera, Hemiptera, Orthoptera, &c.

In the preparation of these publications the institution is indebted for gratuitous assistance to Dr. Jno. Leconte, Baron Osten Sacken, and others.

Conchology.—A large collection of specimens of shells was received from the United States exploring expedition, which has been much increased by subsequent additions. All the shells of the west coast of the United States, and those generally collected by the exploring expedition, have been put into the hands of Mr. P. P. Carpenter, of England, the new ones to be described for publication and the duplicates of the whole to be arranged for distribution to museums, colleges, and other establishments. This work is nearly completed, and a large number of partial sets of the shells have been distributed in accordance with the plan just mentioned. The publications on this subject are lists of North American shells, circulars relative to collecting, an elementary introduction to the study of conchology, and an extensive work in two octavo volumes on the bibliography of North American conchology, by W. G. Binney, and a monograph of the corbiculidæ, by Temple Prime. Besides these a number of articles are in the press or in course of preparation.

Microscopy.—Encouragement has been given to this branch of science by importing as samples simple forms of working microscopes, and also by stimulating our native artists to greater exertion in the construction of this instrument, by ordering the best that could be produced. Samples of microscopic organisms have been collected and distributed to observers, and examinations and reports have

been made on a large number of this class of objects sent to the institution. The publications in regard to this subject are a number of papers by Professor Bailey, of West Point, and a very interesting memoir by Dr. Leidy, of Philadelphia, on a fauna and flora within living animals.

Physiology.—No experiments on this subject have been made under the immediate direction of the institution, although it has furnished the materials for investigation by other parties. The publications in regard to it are chemical and physical researches concerning North American vertebrata, by Dr. J. Jones; researches upon the venom of the rattlesnake, with an investigation of the anatomy and physiology of the organs concerned, by Dr. S. W. Mitchell; on the breathing organs of turtles, by Drs. Mitchell and Morehouse; on the anatomy of the nervous system of *rana pipiens*, by Dr. J. Wyman; and on the medulla oblongata, by Dr. John Dean.

Ethnology and Philology.—One of the earliest efforts on the parts of the institution was directed to the advancement of the science of American ethnology. Its first publication as well as introductory volume to the series of Smithsonian Contributions to Knowledge, being the work of Squier and Davis, on the ancient monuments of the Mississippi valley, remains the standard treatise on this subject. This was followed by a similar work on the antiquities of New York, by Mr. Squier; and those of Wisconsin, by Mr. Lapham of Ohio; and of Lake Superior, by Mr. Whittlesey; a memoir on some antiquities of Mexico, by Brantz Mayer; and a general introduction to the whole subject of American archæology, by Mr. Haven, besides many articles of less extent in one or another of the Smithsonian series. Several pamphlets of instructions for making observations and collections in this science have also been issued.

In the department of philology, also, the institution has evinced its zeal and activity by the publication, among others, of the elaborate work on the Dakota language, by Mr. Riggs; that on the Yoruba language, by Mr. Bowen; and that on the Chinook jargon, by Mr. Turner and Mr. Gibbs. To Mr. Shea, of New York, who is engaged in the preparation of a library of American languages, annual appropriations from the funds of the institution have been made in furtherance of the publication of linguistic memoirs furnished by its correspondents.

Systematic efforts have been directed by the institution to the collection of as perfect a series as possible of the specimens of American antiquities, and of those illustrative of the habits of the modern native tribes. Already an extensive collection has been accumulated, and the preparation and distribution of a series of colored casts of the more interesting specimens of aboriginal art have been commenced. The former picture gallery had just been fitted up with cases two hundred feet in length, for the reception of these, when the disastrous fire occurred, which destroyed the upper part of the center building; fortunately, however, before any of these specimens had been placed in the room.

Correspondence.—The institution has constantly received a large number of communications, asking information on a variety of subjects, particularly in regard to the solution of scientific questions, the names and characters of objects of natural history, and the analysis of soils, minerals, and other materials which pertain to the industrial resources of the country. Answers have in all cases been given to these inquiries, either directly by the officers of the institution or by reports from the Smithsonian collaborators. A considerable portion of the correspondence burned in the office of the secretary was of this character. The loss in this case is to be regretted, not only on account of the valuable information the letters and answers contained, but also on account of the illustration they afforded of the influence of the institution, and the condition of the public mind at a given time. Every subject connected with science which strongly

attracts popular attention never fails to call forth a large number of inquiries and suggestions.

International exchanges.—To facilitate the direct correspondence between the learned institutions and scientific men of the two worlds, and the free exchange of their publications, has, from the first, been a special object of attainment with the Smithsonian Institution. Year by year its plans for this purpose have been modified and improved, until the system has become as nearly complete and satisfactory as the funds and force at its disposal will allow. At the present day it is the great medium of scientific intercommunication between the new world and the old; its benefits and services being recognized alike by individuals, institutions, and governments. Its parcels pass all the custom-houses without question or interference, while American and foreign lines of transportation, with rare exceptions, vie with each other in the extent of the privileges accorded it. To so great an extent has its sphere of activity been enlarged, that it is no exaggeration to say that a very large proportion of all international exchanges of the kind referred to are now made through its instrumentality. At the present time the institution is prepared to receive, at periods made known through its circulars, any books or pamphlets of scientific, literary, or benevolent character which any institutions or individuals in America may wish to present to a correspondent elsewhere, subject only to the condition of being delivered in Washington free of cost, and of being accompanied by a separate list of the parcels sent. Where any party may have special works to distribute, the institution is always prepared to furnish a list of suitable recipients. In many cases where works of value have been published by the United States or State governments, likely to be of importance to students abroad, application has been made by the institution for copies, in most cases with success. The articles and volumes, when received, are assorted and combined into packages, and these, after being properly addressed and enclosed in boxes, are despatched to the agents of the institution in London, Leipsic, Paris, and Amsterdam. The boxes are there unpacked, and the contents distributed through the proper channels; the returns for these transmissions are received by the same agents, and boxed and forwarded to Washington, from which point the parcels for other parties are sent to their proper destination. All the expense of packing, boxing, agencies, freights, &c., being borne by the institution, with the exception of the local conveyance of single parcels by express or otherwise within the United States.

LOCAL OBJECTS.

Under this head we have classed those parts of the programme which were indicated by Congress, and which do not, as directly as the objects we have already described, contribute to the advance of knowledge. It will be seen, however, that they have been made as far as possible to harmonize with the active operations, and to assist in their progress.

Library.—Although the act of Congress directed that provision should be made for the accommodation of a library, on a liberal scale, it was soon seen, after the organization of the institution, that it would be impossible, from the income which could be devoted to it, to establish a first-class general library. Even had this been practicable, it would still have seemed superfluous to do so in the very vicinity of the miscellaneous library of Congress, which is every year increasing in extent under the liberal appropriations which are annually made for the purchase of books. It was therefore deemed preferable, and more consonant with the purposes of the institution, to form a special library, which might constitute, as it were, a supplement to the library of Congress, and consist, for the most part, of complete sets of the proceedings and transactions of all the learned societies in the world, and of other serials essential for reference by students specially engaged in original scientific research. The efforts of the institution to carry out this plan, which has since been sanctioned by Congress, have been

eminently successful. Principally through exchanges, and occasionally by purchase, a more complete collection of the works above mentioned has been procured than is to be found in any library of the United States or is easily met with even in Europe. The institution has been assisted in making this collection by the liberality of many of the older libraries of the eastern continent, which, on application, have furnished from their duplicates volumes and even whole sets to complete series of works long since out of print, and which, in some cases, could not have been obtained through any other means. The library is also quite rich in monographic or special treatises in the physical and natural sciences, lacking as yet, it is true, some of the more expensive volumes, but still affording the means of prosecuting almost any scientific investigation.

One speciality of the library consists of the large number of maps and charts, obtained by exchange from geographical and hydrographical establishments, &c. This collection is as complete as any in the country.

No effort is spared to render the library of the institution conducive to the advance of science. Two editions of the catalogue of serial works have already been published, and a third is now in press; this will probably fill four hundred octavo pages, and will be completed in the course of the present year; to be followed by a catalogue of the special works.

As in most libraries of special character, and, indeed, in most large public libraries, the public are allowed free access to the library room during office hours, but are not generally permitted to take books away. When, however, any applicant is known to be engaged in the prosecution of original investigations, which promise to advance science, and requires the assistance of books found in the Smithsonian library, they are freely lent, even to the remote portions of the United States. Any losses which may occur by the adoption of this course are more than compensated by the advantages derived from it.

Congress had provided by the law of organization that a copy of all copyright works should be presented to the library of this institution. This, it was supposed, would be the means of securing important additions to the library. It was found, however, in practice, to impose a burden on the funds of the institution for which no adequate compensation accrued; copies of the most valuable works were not presented because there was no penalty imposed for the neglect to comply with the requirement, and the expense of clerk hire in recording and furnishing certificates was greater than the value of the articles received, consisting as they did principally of the sheets of music, labels of patent medicines, novels, and elementary works of instruction. The law was, therefore, on special application, so modified that authors were required in future only to send a copy of their works to the copyright bureau of the Department of the Interior.

A special library of the character above described, consisting of serials, must of necessity constantly increase with the additions made to the series of the existing associations which annually publish their transactions. The Smithsonian library, therefore, comprises a principle of indefinite augmentation, both as regards extent and value; and although this increase will result mainly from the exchanges produced by the active operations, yet additional accommodations will be constantly acquired. Hence it may become a matter of consideration, hereafter, whether, since Congress has appropriated \$160,000 to the enlargement of the accommodation for its own library, it may not be expedient to request that the Smithsonian collection be received and arranged as one of its departments, while the free use and general control of the same shall still be retained by the institution.

Museum.—The same remarks which have been made in regard to the library may, with little modification, be applied to the museum. The portion of the funds of the institution which it is practicable to devote to the museum is not sufficient to support an establishment of this kind worthy of the seat of govern-

ment of the United States. Indeed, it is generally now conceded by those who have critically examined the subject, that the accommodation and perpetual maintenance of a large collection of objects of nature and art intended for popular exhibition or even for educational purposes, ought not to have been imposed upon the Smithsonian fund. It has been seen from the foregoing statement how much can be done in the way of advancing natural history independent of a costly edifice, and the support of a museum in which are to be continually preserved even type specimens. It is true that specimens of this character ought to be preserved as well as collected, but seeing that there are in the country a number of special museums which would gladly become the custodians of these objects, and that the hope is yet confidently entertained that Congress will, in due time, establish a national museum which shall rival those of other countries, it has been thought advisable to restrict the collections which are retained in the Smithsonian museum: First, to that made by the exploring expedition, the care of which Congress has devolved upon the institution; and, second, to such type specimens as are not to be found elsewhere, and which are thought of special interest as illustrating the Smithsonian publications.

The museum has been rendered particularly attractive to the visitors and inhabitants of Washington by the large number of birds and mammals which have been mounted for public exhibition, and in this way it has undoubtedly contributed to the popularity of the institution.

The danger, however, to be guarded against, is the constant tendency to expand the collections, and hence gradually to absorb the income in their support. It should be recollected that the building has borne upon the resources of the institution with a cost of more than \$300,000, and that at least an additional \$100,000 will be necessary to repair the recent damages, and this mainly to render the edifice better adapted for the accommodation of the library and museum.

In connexion with the museum a collection has been formed which may, in the future, constitute a gallery of art, but up to the present time the articles have principally consisted of plaster casts of distinguished individuals, and a few pictures which have either been presented to the institution or are the property of the government. The only purchase in this line which the institution has made is that from Hon. George P. Marsh, of a series of valuable engravings to illustrate the early history of art.

Lectures.—As a part of the programme of organization finally adopted, courses of lectures were to be delivered, but instead of attempting to furnish popular instruction by this means to all parts of the country, as was at first proposed, the lectures have been confined to the city of Washington; and in order to render them generally useful, synopses of the more important ones have been published in the annual reports. At the commencement of the institution, and before the plan of organization was generally understood, special care was taken to invite as lecturers men of prominence in the line of literature that they might have an opportunity to become familiar with the plan adopted, and in this way many prejudices were removed and much information diffused as to the character of the establishment.

The lectures were commenced before the building was erected, the first course being in 1847, by the Rev. Dr. Scoresby, of England, on the construction and use of the large telescope of Earl Rosse, and have been continued every winter up to the present time. Until within the last four years they were well attended, and no doubt produced a beneficial effect; but since the commencement of the war and the introduction into the city of a large number of sources of amusement, the audience has fallen off, or has been composed in a large degree of persons seeking amusement rather than information. The most important result produced by the lectures is that derived from their publication.

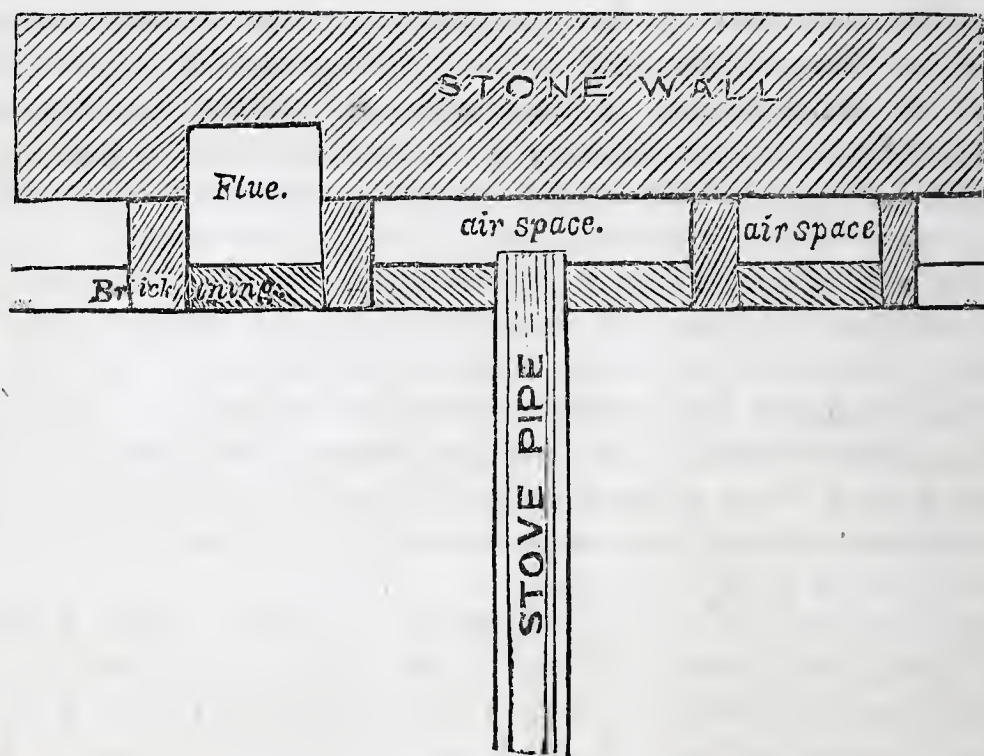
TESTIMONY
RELATIVE TO
THE ORIGIN OF THE FIRE, LOSSES, ETC.

Statement of Colonel B. S. Alexander, United States Army, of the Engineer corps.

WASHINGTON, D. C., *January 25, 1865.*

MY DEAR SIR: After I left you this morning I made an examination to ascertain, if possible, the cause of the fire yesterday at the Smithsonian building.

The cause is manifest. The smoke-pipe, from the stove in the picture gallery, did not enter a flue, as it ought to have done, but was inserted through the brick lining, and discharged the smoke into the general air-space of the building.



The air-space was continued up to the top of the wall, and the smoke and sparks thrown into it from the smoke-pipe were discharged into the space under the roof, close alongside of a tie-beam, and immediately under the boarding. I do not know whether wood or coal was burned in the stove. The sparks from a wood-fire would certainly have set the wooden roof on fire. Coal would not be so dangerous; but even if coal was burned, the fire was, probably, kindled with wood, which would give the sparks; or it may have originated even with a coal fire burning without sparks, by pieces of paper or sweepings having been thrown into the stove.

Very truly, yours,

B. S. ALEXANDER,
Lieutenant Colonel, &c.

Professor JOSEPH HENRY,
Secretary Smithsonian Institution.

Testimony of Spencer F. Baird.

Is assistant secretary of the Smithsonian Institution. Had been in Professor Henry's office at about 2 o'clock p. m. of January 24, and returned through the lecture-room without having his attention attracted by anything unusual. Went into the basement of the main building about 2.30 p. m., and as he entered saw Woltz and De Beust running towards the stairs exclaiming, "The picture gallery is on fire!" Followed them, and on entering the lecture-room saw flame through the registers of the ventilators of the northwest and southwest corners of the room. Went into the picture gallery; saw no appearance of fire or smoke there; found Woltz and De Beust taking down the pictures. Had time to remove a few only from the wall, when a large square of plastering fell from the ceiling, showing a continuous sheet of flame through the hole, and indications of cracking of ceiling elsewhere, and showing that the whole cockloft above was on fire. With the opening thus produced the fire seemed at once to increase in fury, and dense volumes of smoke rolled over the lecture-room skylight, darkening it. Saw there was no probability of saving the roof, and returned to his private office, in the east range, leaving a few persons in the lecture-room. Began to take out of their cases and tie up in bundles the museum catalogues and records, unpublished manuscripts, correspondence, &c., and gave them to persons who had come to offer their services. Told them not to disturb the books, and then went into the document room. Sent out the japanned boxes containing skins of birds, some sixty or more in number, and one case of Cape St. Lucas birds; would not allow the egg cases and others in the room to be disturbed. On returning to office found the book-cases had been broken open, and all the books in that and adjoining room pitched out of the window in the cloister, and another party throwing them from thence outside of the building. Stopped this with aid of a policeman. Found that two cases containing his private collection of birds had been broken open and the birds emptied out and much injured.

After this, spent most of time in museum hall looking after matters there, until it was thought advisable to have the articles brought back into the building, when he superintended their return to the document room.

Did not leave the building from the time the fire broke out until after midnight, and when all the fires had burnt out.

Personal loss consisted of injury, as aforesaid, to his private collection of birds, amounting perhaps to \$150 00 as nearly as can be estimated, some private papers and books missing and others much injured.

As far as now known, no loss or mutilation of any specimens of natural history. Some were wet by the water trickling through the ceiling of the museum, but the damage can be easily repaired. Many labels and stands of specimens, as well as paper trays, soiled or spoiled, and requiring renewal, the latter especially the case with the minerals in the northeast gallery, and in the outer corridor. A few trays of eggs of European birds smashed. Two double-barrelled guns in his office missing, though seen there on the night of the fire by Mr. Bannister and Mr. Elliott.

Believes that a few articles were pilfered by parties present, but is not at present aware of any material loss in this way. Some books were considerably injured by tearing off backs, and scattering sheets.

Know very little of what was going on outside the building. The returning of the property into the east end of the building was accomplished almost entirely by the soldiers.

In addition to the services rendered by the military authorities generally, the firemen, and the police, the institution was very much indebted to the coolness and judgment of Mr. E. S. Smith, superintendent of the Harnden Express

Company, especially for his forethought, inside the museum hall, in preventing unnecessary destruction of the furniture and injury to property. In this he was assisted especially by several of the employés of the Harnden company.

To Mr. Jno. Farrell, Mr. Joseph Tiffany, and other gentlemen, acknowledgments are also due for valuable services rendered in a similar connexion.

Testimony of William J. Rhees.

I have been chief clerk of the Smithsonian Institution for twelve years; have had charge of the accounts, the distribution of the annual reports and documents, the care of the illustrations of the publications, and of the official records and papers generally of the institution. My desk was in the same room with that of the secretary, and this, to be removed as far as possible from interruptions, was on the third floor between the two towers on the north front of the building. To facilitate constant reference, the official correspondence was kept in this room, while the original vouchers for disbursements were kept in an iron safe in the regents' room.

I have always been anxious respecting the safety of the wings of the building from fire, especially as Professor Henry was so particular in his regulations in regard to it for the employés and those who lodged in the building. No one was permitted to smoke in any of the rooms at any time; no candles or lamps were allowed to be carried about, but lanterns were provided, and the watchmen were always instructed to examine the stoves in the rooms at night. The putting up of stoves, cleaning flues, and general direction of fires was in charge of Mr. De Beust.

Several plans had lately been discussed by Professor Henry as to providing additional security against fire, and letters were written last month to Baltimore and Philadelphia to ascertain the price of hose, the desire being to obtain an extra quantity for an abundant supply of water directly to every point of the building. The introduction of large iron water-mains and cocks was also contemplated, and an estimate procured for a fire and burglar alarm-telegraph to be arranged in all parts of the building. No precaution could be taken that was not observed by Professor Henry to guard against accident by fire. The main building, except the roof, which was covered with slate, was considered fire-proof, and not much danger was apprehended in the large towers at the north and south, because the ceilings were so very high, that even if a fire caught it was not thought that it could spread. I had stored, in one of the towers for safe-keeping, a considerable amount of personal property, clothing, trunks, china, books, documents, engravings, and many valuable articles, all of which were lost by the late fire; among these were the manuscript of a work I had been compiling for ten years on the history and statistics of *bequests* to public institutions; a large collection of data relative to public libraries; many rare documents, works, and articles, relative to slavery, free masonry, and the war; a large collection of newspaper cuttings, classified by subjects embracing the principal articles relative to the Smithsonian Institution, science, statistics, libraries, &c., for fifteen years; a very complete collection of the reports and publications of the Young Men's Christian Associations in the United States and Canada.

The loss of such articles as can be replaced by money is about \$1,200.

On Tuesday, January 24, Professor Henry was engaged nearly all morning in dictating to me his annual report. A little after two o'clock, a lady called and wished to examine Stanley's Indian pictures, and the professor accompanied her to the picture gallery. A few minutes afterwards I followed them to the room, having understood that the new arrangement of the pictures had been

completed. After some conversation with the professor as to the appearance of the room, I returned to the office and sat by the stove. It was nearly three o'clock when the professor returned, and he had not resumed work when Mr. C. A. Alexander came in and sat upon the sofa, and took out of his pocket a foreign letter with a translation which he had made. Before he had read it, however, we were all startled by a loud crackling noise immediately over our heads, which I thought, for a moment, was the sliding of ice upon the roof. The noise increasing, Professor Henry said that it must be fire. Mr. Alexander then remarked, "That as he had come up the stairs he smelt smoke like pine burning." We all then rushed to the door opening into the lecture-room, and saw that it was quite dark. Professor Henry exclaimed, "The house is on fire; sound the fire-alarm," and run down stairs. On giving a second look from the door, I perceived a dense smoke over the skylight, and pouring into the lecture-room, and the light of fire in the ventilator, in the southwest corner of the gallery. The noise had by this time greatly increased over our heads, and I saw that no time was to be lost. I went into the office, unlocked a drawer and took out a box, in which were some bonds, &c., deposited with me for safety, rolled it up in paper and carried it down to the basement. I immediately returned to the office, and tried to get in to save some books and papers, but it was so full of dense black smoke that I could not see a foot before me, and becoming choked, I ran to the next floor below and looked into the lecture-room; the room was full of smoke and the ceiling falling in several places. I then got a small ladder out of the wash closet, and assisted some men who had come in to pull down the hose which was kept coiled up near the stairs to the office. I also informed Mr. Force that the meteorological books ought to be removed at once, and advised that they be put out on the roof of the porch, and opened the window for this purpose.

Mr. De Beust, Woltz, and Gant coming in, I told them that we must try to save the letter-books in the secretary's office, and went up with them to direct. We opened the door, but were driven back by the smoke. Mr. De Beust went down stairs and returned with a towel over his face, and went into the office and threw out several armsful of books. The staircase on the west side of the office was now burning rapidly, and fearing that I could not escape if I remained longer, I went down stairs and assisted in taking the meteorological registers out of their cases, and showed men who offered to help what to do. I tried to remove the large barometer, and called for help, as it was too heavy for me to lift, but did not get any. I also carried the "register of reports distributed," and some of the meteorological records, down into the museum. Finding my strength failing, as I had been sick, I went down stairs and through the basement to the outside of the building, to see what was the extent of the fire, and did not return again for an hour or two, when the fire had been pretty much subdued.

Testimony of W. Q. Force.

I have been at the Smithsonian Institution seven years, in charge of the meteorological records and of the meteorological operations of the institution. The records were kept in three rooms on the same floor with the lecture-room, one in the tower on the west and one in the tower on the east of the north door, and the other between these two, all communicating with one another, and none of them fire-proof. My desk was in the east of these three rooms.

A little after one o'clock of the afternoon of the day on which the fire occurred (the 24th of January) Mr. Woltz, the carpenter of the institution, asked me to go into the picture gallery to see the new cases and the new arrangement of the paintings. I went with him, and while on the platform formed by the top of

the cases I noticed that the stove-pipe passed quite close under one of the pictures ; and knowing Professor Henry's constant and extreme anxiety about fire, I placed my hand near the pipe to ascertain whether there was heat enough to cause any danger, but it was barely warm. Mr. Woltz said he had found it too cold to remain in the room without fire, and therefore, without asking permission of Professor Henry, brought the stove from the apparatus room to use while hanging the paintings, and intended to take it back as soon as he had finished. He added, that when Professor Henry saw the stove in the room he objected to its being there, but consented to let it remain, on account of the cold, until the pictures were hung.

Soon after I had returned to my room, a gentleman from New York and a lady from Montreal called on me with a letter of introduction, and desired to see the regents' room. I went into it with them, and also on the top of the high tower, and afterwards into the picture gallery. I did not perceive anywhere any signs of fire.

After this a lady was in my room and asked for Professor Henry, who came down from his office and went with her to the picture gallery. After he had returned and gone up to his office again, there was a sound as of some one calling aloud, and Mr. Horan, the watchman, who was in my room, said, "The professor is calling for some one," went out into the lecture-room, and almost immediately ran back and said to me, "The building is on fire." I went into the lecture-room and saw the light of fire in the ventilator near the ceiling, in the southwest corner of the room, and also heard a crackling sound overhead. I did not go into the picture gallery. I supposed the alarm had been communicated to other parts of the building, for several persons had come into the lecture-room. I called to know if the alarm had been given to the fire-telegraph, and not ascertaining, went down stairs to learn, and on my way down met Mr. De Beust coming up, who said that he had given the signal. I went into my own room and met Mr. Rliees, who asked me what ought to be saved first. I thought the papers in the professor's office ought to be saved first of all ; but I afterwards learned, that owing to the narrowness of the stairway leading to his room, and the rapid approach of the fire and increase of smoke, access to the room was soon cut off. The hose, which was in a recess and near the ceiling, just inside the door leading to my middle room, opposite the lecture-room door, was then uncoiled and the water turned on, though with difficulty, from being long unused. The principal person performing this service was a policeman.

I remained in my room to prevent the loss of meteorological records by unnecessary removal, but finding the fire still spreading I was about to direct them to be taken out, when Mr. De Beust, who had come in, said that the fire could not reach those rooms on account of the thickness of the walls. I thereupon forbid anything being carried out. But the fire approached rapidly, and in a few minutes it became evident that whatever was to be saved must be removed quickly. Several persons (policemen and others) were in the room, and with their assistance, and that of others who were called up, a large portion of the most valuable records were taken out. I remained in the rooms, directing what was most important to be removed, until driven out by the smoke, and then left by way of a ladder from the north portico, on which stones were then falling from the walls of the building. Two persons (whom I did not know) remained with me to the last, and were very efficient, as were also others, in saving the meteorological records. I was not in any other part of the building during the fire, and therefore do not know what occurred there.

Testimony of William De Beust.

I am a machinist; have been in the institution since 1856, and have had general charge of the repairs to the building, apparatus, the fires, gas, water-pipes, &c.

I removed the large stove from the apparatus room, with the assistance of Mr. Woltz, on this day two weeks ago. The fire had been burning in this stove a week previous to the conflagration. It was so very cold that we could not work there without a fire; the removal was temporary, and I intended to replace the stove as soon as the work was finished. When I came to the institution there were two large stoves, one in the picture gallery and one in the apparatus room. The one in the apparatus room has been used every winter since I came. The one in the picture gallery was afterwards put in the connecting range near the library, and subsequently removed by Professor Henry's direction into the library. There had been fire in the stove in the picture gallery since I came, but not for several years. I was not here when the Mechanics' Institute Fair was held.

When we took the stove into the room we noticed a piece of tin tacked on the wall, and Mr. Woltz pulled it off, and found that it covered a hole. I asked him if the flue appeared to have been used he said that it was black with soot. I was called away, and the pipe was put in the hole, and fire made in the stove. The draft was as good as that anywhere. I perceived no smoke at any time unless the stove door was open; then it did smoke, but I did not suspect anything wrong, as smoke often happens under such conditions. The fire was kindled with refuse stuff left by carpenters and broken pieces of strips; coal was then put on and burned all day. The fire was suffered to go down each night before I went away, and was kindled fresh every morning, sometimes by Woltz and sometimes by myself. I always locked the door and kept the key.

On the morning of the fire, near 9 o'clock, I went up through the lecture-room to the loft, and went to extreme west end of the building, and smelt nothing, not even coal gas. The reason I went was that Mr. Woltz said that there were young pigeons up there, and if I did not go up and get them they would fly away. (A large number of pigeons lived in the loft, coming in and out through openings in the round window in the west end of the main building.) I found the pigeons, but they were too young to remove; returned, walking on the joists of the ceiling over the picture-gallery and lecture room, and went down to picture gallery, and was working on the arrangement of the pictures till noon. At 1 p. m. went to picture gallery again, and Mr. Woltz called me away to fix a sled in the basement. Went to my shop and got tools, took shafts off the carriage and measured for two bolts, and returned to the shop and made them, Mr. Woltz and Roger assisting me, then went to basement to put them in the sled. Mr. Woltz was boring a hole in the runners of the sled when I observed smoke passing by door of basement. I ran out and the rest followed, and I could not see where the smoke came from till I got past the south tower, then saw it coming from western portion of the roof of the main building, very dense smoke. I then ran up to picture gallery to see if the fire was there, and could see none, but could hear a roaring, and observed a cloud of smoke over sky light in lecture-room. Went down and got key of the telegraph box, and worked the alarm apparatus; then gave the key to my son Robert, and told him to sound the alarm again; returned to picture gallery, calling on all I could see for assistance. I got up on the new gallery in picture room and commenced pulling down the pictures on the south side, because that was nearest to the ladder. Henry Horan and James helped me to carry them out of the room. I had a large pile ready to be carried out, but Henry and James did not come back, being probably frightened. About six feet square of ceiling had fallen down, exposing the fire, about ten feet from west and eight feet from south side of the

room. I still remained until another part of the ceiling fell down, no one coming to assist. I slid two of the pictures down the ladder and took them into my room; went back and placed a sentinel (a soldier) at regent's room door, with orders not to admit any one. Went into lower office, thence to door of secretary's office, at request of Mr. Rhees, to try to save the letter-books, but smoke was too dense to go in; returned to lower office, wet a towel at the wash-basin, put it over my face and returned to secretary's office, broke the glass in the book case, and commenced removing letter and other books, taking them out in my arms and dropping them down stairs; when the fire burnt through door from lecture room retreated to lower office, then assisted Mr. Force to take out meteorological records, and carried them into main hall; then went down to my room, found fire burning through trap in centre of room; put a wet carpet beneath the trap, so that when the coals fell down they would go out; returned and took the two pictures into basement, then went to my room again, but smoke was so dense that I could not get in, but put a towel over my face a second time and entered and took out a clock. When I found that the fire was coming down so that nothing could be saved above went to fire-engineer to try to save second story offices.

I have had charge of all flues since I came here in 1856. They were regularly swept every year; swept them by drawing through them, top downwards, green cedar boughs.

I supposed where I put the stovepipe in was a true flue, because there had been a stove there before. The hole was made before I came to the institution, and a stove was in the same place.

Knew that there was a furring out of brick about six inches from wall, because we had the steam electric machine put up on north side of apparatus room, and the men who put it up made a hole into the furring, and another hole had to be made to get into the real flue.

My losses of furniture, tools, &c., as near as I can estimate, amount to about \$1,300.

Testimony of Henry Horan.

I am the watchman of the institution, and have acted as such since 1858. Have just received appointment as special policeman for the protection of the property of the institution, as during the winter a number of petty larcenies have been committed.

I was directed by Professor Henry just before the breaking out of the fire to lock the door of the picture gallery. I left the office of Mr Force for this purpose, and on entering the lecture room I saw the flames shining through the ventilators; rushed back to the office and gave the alarm; then broke into the lecture room gallery, and from there into the cockloft, where I saw nothing but smoke and fire. Unable to do anything there I went down into the picture gallery, and commenced assisting to remove the pictures until the ceiling fell, then was compelled to leave. From here I went to the apparatus room, and helped to remove some of the apparatus, when the ceiling again fell, and I was forced to leave. From here I went to the professor's office, and remained there a few minutes; threw out an armful of books, then ran down to the museum, where I procured a hose; carried it up to the back stairs and played on the flames in the lecture room. From here I went into the east wing, helped to remove a few articles; from here to the museum, and prevented the cases from being broken open and the specimens carried out.

I have been the night watchman of the institution for seven years until last autumn, when on account of my health I was allowed an assistant, who divided

the night with me. I watched through the night from 9 p. m. until 6 a. m. According to directions from Professor Henry, I made the rounds of all the rooms, and especially those in which fire had been, every hour, not even omitting those in the residence of Professor Henry, except the sleeping apartments. I constantly kept twenty-four buckets, and two barrels, filled with water in different parts of the building. In addition to this I had three sections of hose, one for the laboratory and the document room, another for the upper rooms in the east wing, and one for the offices and lecture room. The professor was at the time of the fire in negotiation for the purchase of extra hose.

My orders were not to permit any smoking in the building, not to allow any person to carry a light except in a lantern from one part of the building to another.

To insure a habit of wakefulness when I first came here, I was obliged to make a register on a "tell-tale clock" at the end of every hour.

The greatest fear on my part of danger from fire was in the fish-room under the west wing, in which a large number of alcoholic specimens were stored, and in the document room. To these apartments particular attention was always given. I had no idea that the fire would break out in the roof.

I lost articles at the fire worth at least \$50.

Testimony of T. N. Woltz.

I am a carpenter; have been employed in the institution for about eight year in making cases for specimens, packing boxes, repairs to the building, &c.

Mr. De Beust had the stove put in the picture gallery; he said that it was too cold to work without a fire, and I assisted him to move it in from the apparatus room. Mr. Varden also said he could not work there without a fire. I don't remember when it was put in. I think it was on Monday, a week before the fire. The stove-pipe hole was already there in the wall, and a square piece of tin tacked over it. I removed the tin myself. I said to Mr. De Beust, "I wonder if there is any danger." He replied that he did not think that there was any. I then put my hand in and found soot there, showing that it had been used before as a flue. Roger built the fire, and it drew first rate, and made no smoke in the room. I never saw a particle of smoke during the time the fire was there.

On the morning of the fire I told Mr. De Beust that there were two pair of pigeons in the loft, in the west end of the main building, and that he had better go up and get them, and this was about 9 o'clock; De Beust then left and shortly afterwards returned, saying the pigeons were too small. I had been raising pigeons in the loft for about a year, and went up frequently to see about them. I had been up a few days before. I had no key to the door, but always asked Mr. De Beust to go with me, or to let me up.

On Tuesday afternoon I was in the basement fixing shafts on a sled and wanted more light; on opening the south door Mr. De Beust and Roger went with me out of the door, and we saw smoke coming down from the roof. I thought it was the tower on fire. I went up into the lecture room and tried to break in the door to the lecture room gallery, but could not. I then saw fire through the ventilator register in the lecture room and went into the picture gallery and found Mr. De Beust and Henry Horan getting pictures down, and assisted them until the fire came down from the ceiling. I then ran to Mr. Force's office and up to the Secretary's office, to try to get out books.

The chimneys were all swept last fall.

I staid in Mr. Force's room till the last, when the ceiling was falling in, and then got down by a ladder from the portico.

Testimony of Roger Sullivan.

I have been in the institution as laborer for more than twelve years, and make most of the fires, carry coal to the stoves and furnaces, &c. I helped to carry the stove from the apparatus room to the picture gallery on the 16th of January, or this day two weeks ago. I do not know what the stove was taken in there for, but was called by Mr. De Beust to assist him to remove it. After the stove was put up by the direction of Mr. De Beust, I started the fire with dry kindling wood, and then put in two scuttles of coal, which filled it about two-thirds full. The second morning I found that the fire had been already kindled with wood; I put on two buckets of coal; the same thing was repeated every day until the occurrence of the fire, with the exception that I added a little more kindling wood before putting on the coal each morning. The draft was as good as any stove in the building. I think that the hole in the wall was made when the Mechanics' Institute fair was held here; a stove was there at that time and fire in it; I do not recollect of a fire having been there since that time, but I cannot say that there has not been one. I was down in the basement wheeling out ashes in the fire-room on the day of the fire, until Mr. De Beust called me up to his shop in the tower. When we came down from the shop to the basement I saw nothing unusual until Mr. De Beust asked me, "What is that smoke?" On which we all ran out together to the south side of the building; we could see nothing but a dense cloud of smoke; from whence it came we could not tell, until we had got around the south tower, when we saw it issuing from the roof of the main building, over the picture gallery; I then went up into the lecture room and saw fire shining through the register; I stopped there till Mr. De Beust came up and then followed him into the picture gallery; he went up the ladder and commenced taking down the pictures, and handed two of them to me, which I took down to the floor of the museum. Before I left a part of the ceiling fell down, and I did not return because I thought it very dangerous. All the flues which had fire in them were swept in the fall.

Testimony of Theodore N. Gill.

Am assistant in Smithsonian Institution, acting as librarian. On the day of the fire was engaged on the lower floor of the library, when, between 2½ and 3 o'clock p. m., I was summoned to the gallery in a tone of alarm by Miss Jane Turner, an assistant in the library, who expressed the belief that the building must be on fire; went up stairs and saw a large volume of smoke apparently issuing from the rear of the main building; men were also seen running towards the building; could, however, scarcely realize that there could be a fire, on account of the extreme precautionary measures that had been enforced in the Institution; was about hastening towards the east end when I met Mr. George Gibbs, who informed me that the building was on fire; dismissed some visitors from the library and left Miss Turner to lock the door; ran to the east end of the building; men were in the rooms used as offices and studies, removing various articles; assisted in removing some myself; then went, I think, to Professor Henry's house, and afterwards to my sleeping-room; packed in a valise a few articles; after placing the valise by the side of the meteorological records in the main hall of the museum, returned to east end, and learning that the fire would probably be stayed, dismissed a number of men from the rooms, and asked a police officer there present to keep them out; went then to Professor Henry's house and assisted in carrying articles back into the house. I think that it was

after this that I went to the library and found that the door had been forced open. Mr. Gavit, of New York, and a man who stated that he had been requested by Professor Henry to attend to the library, were in the room; stayed there a few minutes; nothing appeared to have been disturbed; obtained a board and nails; secured the former across the doors, and procured a guard to take charge of the room. My losses amount to about \$50.

Testimony of F. B. Meek.

I have been for several years engaged in the preparation of reports for State geological surveys, and in identifying the paleontological collections of the institution, and preparing duplicates for distribution. Have received no salary, but had the use of a working room and sleeping apartment.

At the time the late fire broke out at the Smithsonian Institution (between the hours of two and three o'clock p. m., on the 24th instant) I was in a study and working room adjoining Professor Baird's office, on the second floor of the east wing, between Professor Henry's residence and the main central building. I had completed correcting some proof-sheets which I had placed in Professor Baird's office, and returned to the room where I had read the proof-sheets, and I believe commenced, or was about to commence, working at some drawings, when I noticed that it suddenly grew very dark.* I think I was in the act of going to a window in the southwest corner of the room to look out, thinking the darkness was probably produced by a snow storm, when Professor Baird suddenly opened a door on the north side of the room, opening into a passage leading up into the main building, and hurriedly informed me that the building was on fire. This was the first intimation I had of the fire.

Thinking it was probably some of the wood work recently erected in the picture room that had caught fire, I ran up, hoping we might be able to extinguish it. On passing through the apparatus room into the lecture room I saw the flames in the garret over the west corner of the lecture room through the ventilators. Several persons were running towards the picture room, and as I passed in that direction I observed Professor Henry open an upper door leading from his office into the lecture room, and then hurry back. Almost at the same instant I saw Henry Horan (the watchman of the institution) and some others trying to force open a door leading up into the gallery of the lecture room, nearly under one of the ventilators, through which we could see the flames. Seeing that they could not open the door, I caught hold of it and assisted in pulling at it, but it would not yield, until a man came with a screw-driver, or something of the kind, and forced back the bolt, when the door flew open. Henry Horan, and perhaps others, hurried up the stairway, but I ran back for some buckets of water I knew Professor Henry had caused to be in readiness in case of fire. Some of these were in a lower piazza, near the document room, in the east wing. I picked up two of the buckets and started up with them, but soon discovered that the water in them was frozen apparently solid. I then left the buckets and went back to the lecture room, and seeing that the garret over the lecture room and picture gallery appeared to be all in flames, and knowing of no way to reach that part of the building, I realized that all efforts to extinguish the fire would be useless, and turned my attention to saving movable property.

My own sleeping apartment was a small room under the gallery stairs in the southeast corner of the lecture room. Knowing this part of the building to be

* Caused, as I believe, by a thick cloud of smoke from the burning roof blowing over the eastern part of the building.

in the most immediate danger, I entered my sleeping room and hurriedly threw into my trunk such small articles of clothing, &c. as were lying about, and dragged it out, and down into the piazza in the east wing. I then went back after my bedding, and on reaching the lecture room I noticed the plastering falling from the ceiling, and the flames plainly visible through the openings along the west side of the lecture room. After carrying down my bed-clothes I turned my attention to the property in our study in the east wing, which I thought would be consumed. During the remainder of the fire, or until it became evident that the east wing of the building could be saved, my efforts were directed to saving my own books, manuscripts, drawings, &c., and some valuable books belonging to the Smithsonian library in our study.

Subsequently I assisted in carrying these and other property back into the east wing of the building. My personal losses amount to about \$50.

Testimony of William Stimpson.

Has been employed in scientific work upon the collections of the institution for several years, receiving no regular salary, but being furnished with a room to sleep in and deposit private property. Was absent from the city at the time of the fire, in Chicago, from which place he returned immediately upon reception of the news. Finds that his books and manuscripts had been partly removed from his case in the working room, but had been mostly recovered and returned. His private room, in the northeast tower of the main building, was not injured by fire, but was necessarily broken into in order to gain a passage into the apparatus room from the roof of the range, in which the fire was then raging. After the fire some persons gained access to this room, and injured or destroyed or appropriated nearly all the property there. The wardrobe, trunk, and bureau were broken open, and their contents stolen. The amount of loss is about \$170. A few of the articles were recovered from persons as they were taking them out of the building, but the greater portion was lost.

Testimony of Henry W. Elliott.

I am a temporary assistant in the Secretary's office. At the time of the breaking out of the fire I was in the office of Professor Baird engaged in writing. I suddenly observed that the room was growing very dark; looked up to the window and saw clouds of smoke passing by. I thought then that the men about the building were burning some rubbish just beneath the window, and was getting up in order to look at them, when Professor Baird came in and said the "picture gallery is on fire!" I then ran up towards it through the apparatus room, and on reaching the lecture room saw the fire shining through the two ventilators just beneath the ceiling on the west wall of the lecture room. I then made a rush for my room in the high tower, and on reaching it found on opening the door that it was black with smoke; unable to breathe in it, I drew in a full breath outside of the door, and entered, rapidly picked up a few clothes which were lying on a chair by my bed, and was then forced to leave. I ran down stairs through the lecture room, which was quite lurid from the reflection of the fire in the ventilators and the large skylight just above the stage; I carried my clothes through the apparatus room, and down through Professor Henry's house, and left them outside of the building with a pile of clothing and furniture. I then returned through the house, and ran for the secretary's office, but on reaching